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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/777,585	02/12/2004	Yoshihide Iwaki	JG-YY-5095C/500569.20104	4937

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REED SMITH, LLP
ATTN: PATENT RECORDS DEPARTMENT
599 LEXINGTON AVENUE, 29TH FLOOR
NEW YORK, NY 10022-7650

EXAMINER

STEELE, AMBER D

ART UNIT	PAPER NUMBER
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1639

MAIL DATE	DELIVERY MODE
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06/11/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/777,585

Applicant(s)

IWAKI ET AL.

Examiner

Amber D. Steele

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007 and 27 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5,6,8,9 and 13-17 is/are pending in the application.
- 4a) Of the above claim(s) 8,9 and 13-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5,6 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2-12-2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/927,697.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

1. Claim 1 was amended and claims 2-4 and 10-12 were canceled in the amendment to the claims received on June 12, 2006.

The amendment to the claims received on February 20, 2007 canceled claims 1 and 7, amended claims 5-6, and added new claim 17.

Claims 5-6, 8-9, and 13-17 are currently pending.

Claims 5-6 and 17 are currently under consideration.

Election/Restrictions

2. This application contains claims 8-9 and 13-16 drawn to inventions nonelected without traverse in the reply filed on June 12, 2006. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Priority

3. The present application claims status as a CON to application 09/927,697 filed August 9, 2001 (now abandoned). In addition, the present application claims foreign priority to JP 2000-241773 filed August 9, 2000 and JP 2001-161199 filed May 29, 2001.

4. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copies have been filed in parent Application No. 09/927,697, filed on August 9, 2001 and the translations were received on March 27, 2007.

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Withdrawn Objections/Formalities

5. The objection to the declaration as being defective for not referencing U.S. Patent Application 09/927,697 is withdrawn in view of the amendment to the first line of the specification received on February 20, 2007 regarding U.S. Patent Application 09/927,697.
6. The objection to the disclosure regarding reference to U.S. Patent Application 09/927,697 is withdrawn in view of the amendment to the specification received on February 20, 2007.
7. The objection to claim 1 regarding “a number of vinylsulfonyl groups are fixed an aqueous solution” is withdrawn in view of the cancellation of claim 1 in the amendment received on February 20, 2007.
8. The objection to claim 1 regarding mPs s is withdrawn due to the cancellation of the claim.

New Objections Necessitated by Amendment

9. Claim 17 is objected to because of the following informalities: The viscosity units of pascal-second(s) is typically written as mPs·s and not mPs s; the phrase “and water and having a viscosity” is considered a typographical error (“and water having a viscosity” is suggested). Appropriate correction is required.

Withdrawn Rejections

10. The rejection of claims 1 and 5-7 under 35 U.S.C. 112, second paragraph, as being indefinite regarding the phrases "thickening agent", "aqueous solution", "spotting onto a solid carrier...in which a number of vinylsulfonyl groups are fixed an aqueous solution", and "surface active agent" is withdrawn in view of the cancellation of claim 1 and the amendment to claim 6 in the amendment to the claims received on February 20, 2007.

11. The rejection of claim 7 under 35 U.S.C. 112, second paragraph, as being indefinite regarding the limitation "each of the aqueous solutions" is withdrawn in view of the cancellation of claim 7 in the amendment received on February 20, 2007.

12. The rejection of claims 1 and 6-7 under 35 U.S.C. 102(b) as being anticipated by Sutton et al. U.S. Patent 5,888,723 issued March 30, 1999 is withdrawn in view of the claim amendments received on February 20, 2007 regarding the requirement for carboxymethylcellulose in the aqueous solution.

13. The rejection of claims 1 and 6-7 under 35 U.S.C. 102(e) as being anticipated by Makino et al. U.S. Patent 6,864,055 filed June 22, 2001 is withdrawn in view of the translations provided for the foreign priority documents on March 27, 2007.

14. The rejection of claims 1 and 5-7 under 35 U.S.C. 103(a) as being unpatentable over Sutton et al. U.S. Patent 5,888,723 issued March 30, 1999 and Ebersole et al. U.S. Patent

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5,695,925 issued December 9, 1997 is withdrawn in view of the claim amendments received on February 20, 2007 regarding the requirement for carboxymethylcellulose in the aqueous solution.

15. The rejection of claims 1 and 5-7 under 35 U.S.C. 103(a) as being obvious over Makino et al. U.S. Patent 6,864,055 filed June 22, 2001 and Ebersole et al. U.S. Patent 5,695,925 issued December 9, 1997 is withdrawn in view of the translations provided for the foreign priority documents on March 27, 2007.

New Rejections Necessitated by Amendment

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 6 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sutton et al. U.S. Patent 5,888,723 issued March 30, 1999 and Moynihan et al. U.S. Patent 6,365,349 filed July 21, 1998.

For present claim 6, Sutton et al. teach that the wash medium contains a buffered solution of sodium phosphate, sodium chloride, ethylenediaminetetra-acetic acid, and decyl sulfate (e.g. SDS or sodium dodecyl sulfate; please refer to column 15; Examples 3-4).

For present claim 17, Sutton et al. teach methods of covalently attaching oligonucleotides to supports via polymers. In addition, Sutton et al. teach that the oligonucleotides are spotted in

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uniform, defined regions onto the support. Furthermore, Sutton et al. teach that the oligonucleotides are covalently bound to the support via polymers including polyacrylamides, vinylsulfonyl, and amino groups. Moreover, Sutton et al. teach viscosity of less than 1 poise (e.g. less than 100 mPs·s; encompassing the presently claimed range of 2-50 mPs·s). Additionally, Sutton et al. teach washing of the arrays. Please refer to the entire specification particularly abstract; columns 2-15; Examples 3-4; claims 1, 12, 18, 20, and 22.

However, Sutton et al. does not specifically teach carboxymethylcellulose as a thickening agent.

For present claim 17, Moynihan et al. teach methods of producing microarrays via spotting a composition comprising a thickening agent including cellulose (i.e. carboxymethylcellulose), oligonucleotides or polynucleotides including DNA and PNA which can have a terminal amino group, and water with a viscosity of 6-80 centipoise (i.e. 6-80 mPa·s), incubating the solid support and composition, and washing (please refer to the entire specification particularly abstract; Figures 1A, 1B, 2A; columns 3, 7-8; claims 6, 9, 17, and 23).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to alter the method of making a microarray with vinylsulfonyl groups taught by Sutton et al. with the method of making microarrays taught by Moynihan et al. with the thickening agent.

One having ordinary skill in the art would have been motivated to do this because Moynihan et al. teach that the thickening agent is useful for various reasons including (a) increasing the viscosity of the aqueous solution to be spotted which allows for more defined droplets to be consistently produced, (b) rheological properties desirable for the type of spring-

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loaded tip that may be used for spotting, (c) increases types of supports that may be spotted, (d) allows low concentrations of additional reagents in the aqueous solution, (e) provides quality control (please refer to columns 7-8).

One of ordinary skill in the art would have had a reasonable expectation of success in the modification of the method of making a microarray with vinylsulfonyl groups taught by Sutton et al. with the method of making microarrays taught by Moynihan et al. with the thickening agent because of the working examples provided by both Sutton et al. and Moynihan et al.

Therefore, the presently claimed invention is *prima facie* obvious over the teachings of Sutton et al. and Moynihan et al.

18. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sutton et al. U.S. Patent 5,888,723 issued March 30, 1999 and Moynihan et al. U.S. Patent 6,365,349 filed July 21, 1998 as applied to claims 6 and 17 above, and further in view of Ebersole et al. U.S. Patent 5,695,925 issued December 9, 1997.

Sutton et al. teach methods of making microarrays via covalently attaching oligonucleotides to supports with vinylsulfonyl and comprising spotting an aqueous solution, incubating, and washing and Moynihan et al. teach methods of producing microarrays comprising spotting an aqueous solution comprising a thickening agent including cellulose, incubating with a solid support, and washing.

However, neither Sutton et al. nor Moynihan et al. teach divinylsulfone.

For present claim 5, Ebersole et al. teach arrays of analyte-polymers wherein the analyte can be DNA, biological receptor, or amino acids. In addition, Ebersole et al. teach that the

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anilate can be covalently bound or covalently coupled to the polymer. Furthermore, Ebersole et al. teach that the attachment of the analyte can be via divinylsulfone. Please refer to columns 5-13; Examples 1-9.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the specific species of vinylsulfonyl (e.g. divinylsulfone) taught by Ebersole et al. in the methods of producing arrays taught by Sutton et al. and Moynihan et al.

One having ordinary skill in the art would have been motivated to do this because divinylsulfone is an art recognized species of vinylsulfonyl and the specific species utilized in the method would be a design choice. In addition, Ebersole et al. teach that there is a need in the art for polymers that retain the ability to form a composite with the surface of a sensor (please refer to column 3).

One of ordinary skill in the art would have had a reasonable expectation of success in the utilization of the specific species of vinylsulfonyl (e.g. divinylsulfone) taught by Ebersole et al. in the methods of producing arrays taught by Sutton et al. and Moynihan et al. because of the examples provided by Ebersole et al. (Examples 1-9), Sutton et al. (Examples 3-4), and Moynihan et al. (Examples 1-18).

Therefore, the utilization the specific species of vinylsulfonyl (e.g. divinylsulfone) taught by Ebersole et al. in the methods of producing arrays taught by Sutton et al. and Moynihan et al. render the instant claims *prima facie* obvious.

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Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Future Communications

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amber D. Steele whose telephone number is 571-272-5538. The examiner can normally be reached on Monday through Friday 9:00AM-5:00PM.

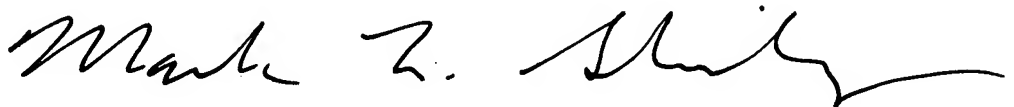
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doug Schultz can be reached on 571-272-0763. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ADS

June 1, 2007

A handwritten signature in black ink, appearing to read "Mark L. Shibuya", with a long horizontal flourish extending to the right.

MARK L. SHIBUYA
PRIMARY EXAMINER